Additional Activities

Honey Bee Math

Answer the following questions using these honey bee facts.

Weight of average worker bee: 80 milligrams

Amount of nectar the honey sac can hold: 70 milligrams

Amount of pollen a worker can carry in the pollen baskets: 20 milligrams

Maximum number of eggs laid daily by the queen: 3,000

Average number of trips a worker bee makes outside the hive each day: 10 trips

Average speed of a worker bee in flight: 15 miles per hour

Average distance from hive a worker bee travels in one trip: 1-1/2 miles

Average life of a worker bee in the summer: 45 days

1. What is the average total weight a worker bee carries in both nectar and pollen per trip?
   Amount of nectar _____ + amount of pollen _____ = _____ Total Weight

2. What is the amount of nectar one worker bee could contribute to the colony in one day?
   Amount of nectar carried in one trip ____ x number of trips in one day _____ = _____ Total Nectar

3. What is the ratio of the total weight of a full load of nectar and pollen carried by the worker bee in one trip as compared to her body weight?

4. If you could carry the same amount of weight in comparison to your body weight as a honey bee, how much weight could you carry?

5. Approximately how many weeks does a worker bee live in the summer?

6. About how long would it take a worker bee to fly to a garden 2 miles away?

7. If a worker bee completes 10 trips to a garden 3/4 of a mile away, how many total miles has she flown? How much time has she spent flying in that day?

8. How many miles does the average worker travel in one day?

9. What is the maximum number of eggs a queen bee could lay in one week?

10. How many days would it take a queen to lay 12,000 eggs?

11. What is the maximum number of eggs a queen bee could lay in a year?

12. If a hive has 48,000 bees, approximately how long would it take the queen to lay that many eggs?

13. If a hive has 60,000 bees and 1 percent of those bees are drones, how many drones are in the hive?

14. Since there are 1,000 milligrams in a gram, about 28 grams in an ounce, and 16 ounces in a pound, how many milligrams of pollen would equal one pound?

15. Since a bee can beat her wings 183 times per second, how many times can she beat her wings in one minute?

16. If one worker bee will gather 1/12 of a teaspoon of honey in her lifetime, how many bees would be necessary to gather 1 pint of honey?
   (3 teaspoons = 1 tablespoon, 16 tablespoons = 1 cup, 2 cups = 1 pint)

17. If honey bees visit 2 million flowers to make one pound of honey, how many flowers would the bees need to visit to make a ton of honey?

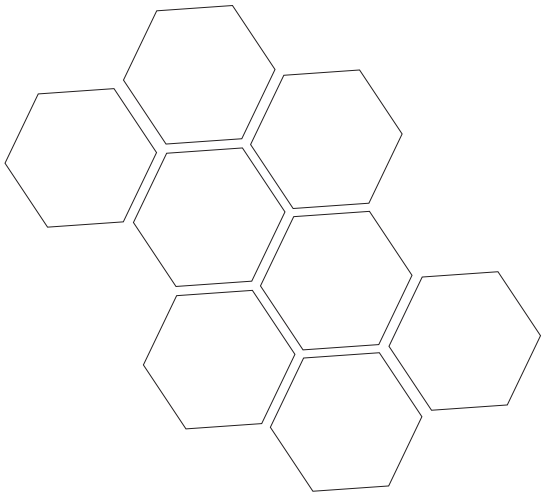
18. If you wanted to make four hexagons on a flat surface out of toothpicks, what is the least amount of toothpicks needed for your design?

19. During its first day, a larva eats so much that its weight increases five and a half times. If the same thing happened to a student weighing 70 pounds today, how much would he or she weigh tomorrow?

20. If a worker bee can visit ten flowers a minute, and visits 600 flowers before returning to the hive, how long will she be out foraging?

RECIPE

HONEY CARE TO TAKE A DIP



1 pint (16 oz.) lowfat plain yogurt

1/4 cup honey

2 Tablespoons orange juice

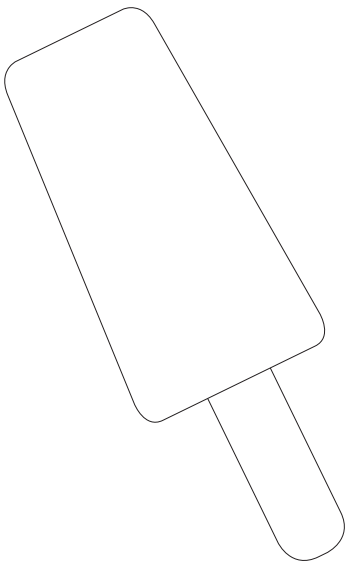
1/2 teaspoon grated orange peel

Assorted fruits for dipping such as sliced apples, pears and strawberries

Combine yogurt in a small bowl with honey, orange juice and orange peel; mix well. Serve with sliced fruit. Makes 2-1/4 cups.

RECIPE

KALEIDOSCOPE HONEY POPS



2-1/4 cups water

3/4 cup honey

3 cups assorted fruit, peaches, nectarines and raspberries, cut into small pieces

12 3-oz. paper cups or popsicle molds

12 popsicle sticks

In a pitcher, whisk together water and honey until well blended.

Place 1/4 cup fruit in each mold.

Divide honey-water mixture between cups.

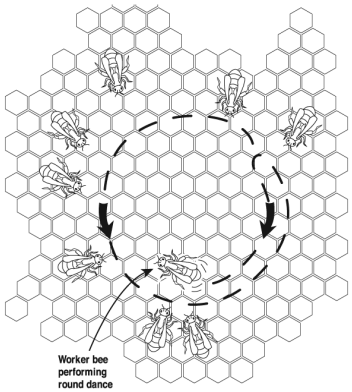
Freeze until partially frozen, about 1 hour.

Insert popsicle stick; freeze until firm and ready to serve. *Makes 12 servings.*

Honey Bees - SOCIETY

Honey, I'd Love to Dance

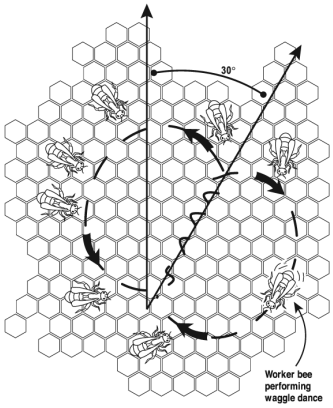
Honey bees communicate with each other by dancing. After a honey bee has found food she tells the other bees when she returns to the hive. The bee will dance on the honeycomb, while the other bees feel the dancing bee and learn where the food is. By smelling the dancing bee and getting a taste of her load of nectar, the other bees can tell what type of flower she has visited. Different dances are used when the food is close to or far away from the hive. Bees have receptors on their feelers and legs which they use to feel the dance.

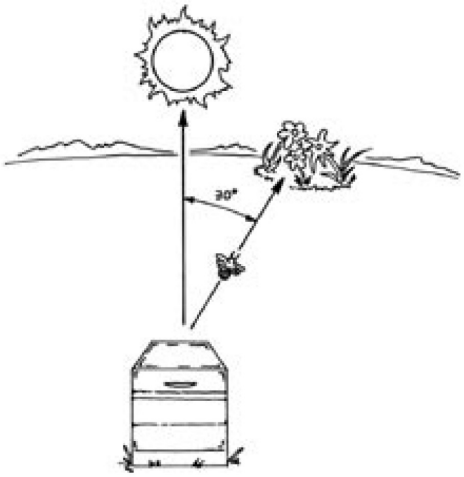


There are several bee dances, but the most common are the round dance and the waggle dance.

Round Dance

When food is close to the hive (less than 100 yards), a worker bee performs the round dance. She goes round and round, first one way and then the other. The round dance does not show the exact location of the flowers so fellow worker bees must fly out in many directions looking for them.





Waggle Dance

If the flowers are more than 100 yards away from the hive, the returning bee performs the waggle dance. The bee dances a half circle in one direction, turns, and runs straight while wagging her abdomen. Then she dances a half circle in the other direction. These two half circles form a figure eight.

If the food is in the same direction as the sun, the central run of the dance is straight up the comb. If the food is to the left or right of the sun, the bee alters the direction of the dance by the correct amount to the left or right of the upright line.

The distance between the hive and the food is communicated by the speed of the dance and the buzzing sound made by the dancing bee. The faster the worker dances, the closer the food. The waggle dance shows both location and distance of the flowers, so the bees know where to fly.

Honey Bees - SOCIETY

What Bees Eat

Children are most likely to encounter honey bees that are foraging on flowers. Bees may fly long distances (up to six miles from the hive) in search of food and may be quite far from home when they are seen in your yard. Worker bees gather both pollen and nectar from flowers to feed larvae and other members of the colony. Nectar is the sweet fluid produced by flowers to attract bees and other insects, birds and mammals. Worker bees drink the nectar and store it in a pouch-like structure called the honey sac. They fly back to the hive and pass the nectar to other "house bees." The house bees mix the nectar with enzymes and deposit it into a cell where it remains exposed to air for a time to allow some of the water to evaporate. The bees help to speed the evaporation by fanning the open cells with their wings. After the enzymes are added and the water is evaporated, the nectar becomes honey. The bees then cap the honey cells with beeswax.

Honey bees have lots of little hairs on their body. Pollen sticks to the hairs while the bees are visiting the flowers. A furry little bee wiggling around inside the flower picks up a lot of pollen. After getting pollen on their body hairs, the bees move it to a special area on their hind legs called pollen baskets. Foraging bees returning to the hive often have bright yellow or greenish balls of pollen hanging from these pollen baskets.

Pollen is the yellowish or greenish powder-like substance that comes from flowers. It may be quite sticky. Honey bees mix the pollen with some nectar to form a mixture called beebread that is a protein-rich food used to feed larvae.

Answer the following questions:

1. When bees search for food, it is called_____.
2. Worker bees gather _____ and _____ to feed to the larvae and other bees.
3. The sweet fluid produced by flowers is known as_____.
4. When nectar is mixed with enzymes from a honey bee it becomes _____ .
5. How do bees help the process of evaporating water from the honey? _____

_____

6. How do bees gather pollen while visiting flowers? _____

_____

7. The special areas on the hind legs of honey bees for storing pollen are called _____.
8. Nectar and pollen mixed together to feed larvae is called _____.
9. How do honey bees store honey for future use? _____

_____

10. Honey bees can fly up to _____ miles in search of food.

Source: National Honey Board